CLINICAL ETHICS

Do-not-resuscitate decision: the attitudes of medical and non-medical students

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Objectives: To study the attitudes of both medical and non-medical students towards the do-not-resuscitate (DNR) decision in a university in Hong Kong, and the factors affecting their attitudes.
Methods: A questionnaire-based survey conducted in the campus of a university in Hong Kong. Preferences and priorities of participants on cardiopulmonary resuscitation in various situations and case scenarios, experience of death and dying, prior knowledge of DNR and basic demographic data were evaluated.
Results: A total of 766 students participated in the study. There were statistically significant differences in their DNR decisions in various situations between medical and non-medical students, clinical and preclinical students, and between students who had previously experienced death and dying and those who had not. A prior knowledge of DNR significantly affected DNR decision, although 66.4% of non-medical students and 18.7% of medical students had never heard of DNR. 74% of participants from both medical and non-medical fields considered the patient's own wish as the most important factor that the healthcare team should consider when making DNR decisions. Family wishes might not be decisive on the choice of DNR.
Conclusions: Students in medical and non-medical fields held different views on DNR. A majority of participants considered the patient's own wish as most important in DNR decisions. Family wishes were considered less important than the patient's own wishes.

For many years, there have been numerous discussions on various forms of end-of-life decisions around the world, and there are continuing debates about the ethics, legalities and appropriate medical indications for the use of do-not-resuscitate (DNR) orders. Factors affecting patients' decisions on the acceptance or withholding of life-sustaining treatment include acceptance of the inevitable progression of disease, trust towards doctors, a feeling of burden to others, symptom burdens, the will to live and the preference to die naturally.[1] There have been limited studies exploring the professional attitudes towards cardiopulmonary resuscitation (CPR), especially in non-Western countries.[2]

DNR orders are frequently used nowadays, but in practice there are wide local differences in their implementation.[3] In Hong Kong, the making of an end-of-life decision should be based on a proper consensus-building process between the care team, the patient and his or her family. When making such a decision, the patient's autonomy is an important factor.[4 5] However, premorbid functional conditions, prognosis and quality of life are also considered.[6]

Studies have been carried out in different countries around the world to study the different factors influencing doctors when making a DNR decision. These studies investigated the effects of the probability of survival, a patient's wish, previous quality of life and expected quality of life after the acute illness.[7–11] We have searched Medline and PubMed using the keywords ''do not resuscitate'' and ''end-of-life decision'', yet there are only a few local studies on this topic.[5 6 12] Moreover, the views of people in the medical field and those outside the field have not been compared.

Healthcare workers might hold different views on DNR from those outside the field. Medical education, especially clinical training, might have changed a person's views on DNR decisions. It would be worthwhile to explore the attitudes of medical and non-medical university students towards when and when not to make a DNR decision, which might reflect the influence of the medical education they have received. It is also worthwhile to investigate the difference in attitudes between clinical and preclinical medical students, as this might reflect the effect of clinical exposure on their attitudes. In making DNR decisions, it would be useful to note this difference, if any, in attitudes between people within and outside the medical field.

SUBJECTS AND METHODS

Questionnaires were distributed to medical and non-medical students of the University of Hong Kong in the campus in January and February 2005. We distributed the questionnaires in lecture theatres, before lectures began, to all the five classes of medical students, and we randomly selected five classes of non-medical students for questionnaire distribution. We set a counter outside the lecture theatres, where students could return the questionnaires to us after their lessons. Return of the completed questionnaire implied consent to participate in the study. The validity of the questionnaire was confirmed by a palliative medicine specialist and an anaesthesiologist. A pilot study was performed on medical students and the questionnaire was modified according to comments from participants. The questionnaire was written in English, but Chinese translations were given next to the medical terms. Whenever the participants had any queries, an explanation was given by one of the researchers. Participants were asked to determine whether DNR should be given to the respective patient in each of the clinical situations, by giving a score from 1 to 6 (1 = strongly disagree, 6 = strongly agree). Two clinical scenarios were given and five factors commonly considered in DNR decisions were provided for the participants to prioritise in each of the scenarios. Box 1 elaborates the two scenarios. The five factors were the patient's autonomy, general physical health

Abbreviations: CPR, cardiopulmonary resuscitation; DNR, do-not-resuscitate

Box 1 The two scenarios in the questionnaire

- **Scenario 1:** A 90-year-old man has good past health and is capable of taking care of himself. He attends a number of social functions such as Tai Chi classes, and has often volunteered at community centres. He develops severe pneumonia. Despite the best treatment, the chance of the patient recovering from the disease is very low. The patient and the family want cardiopulmonary resuscitation (CPR) on the patient when cardiac arrest occurs.
- **Scenario 2:** A 35-year-old man is infected with HIV (the virus that causes AIDS) from blood transfusion. He is socially active. He develops severe pneumonia and requires mechanical ventilation. His doctor believes that his condition will get worse. The patient and the family want CPR on the patient when cardiac arrest occurs.

and social well-being, cost to the government and family wishes. Five modifications of the scenarios were then given, so as to give additional criteria for participants to consider their priority, such as patients expressing a wish to die, having pre-existing illness, being socially isolated, high cost of treatment and family insisting on DNR. The participants were then requested to reprioritise the five factors.

Statistical analysis

Differences of responses between students in different groups were assessed by the Pearson χ^2 test. The linear-by-linear association value and the p value were obtained. Significance was defined as $p<0.05$. SPSS V.13.0 was used for statistical analysis.

Ethical approval

The study was approved by the Institutional Review Board of the University of Hong Kong/Hong Kong West Cluster of the Hong Kong Hospital Authority.

RESULTS

A total of 1559 questionnaires were distributed and 766 completed questionnaires were returned. The response rate from medical students was 71.4% and that from non-medical students was 28.4%. The overall response rate was 49.1%. No comments were received from the non-responders for not responding.

Among the participants who submitted valid questionnaires, 48.0% were male and 52.0% were female. Their ages ranged from 18 to 25 years. There were 528 medical students and 223 non-medical students. As it may not be appropriate to classify nursing and dental students as non-medical students, the eight questionnaires returned by nursing and dental students were not included in the comparison between medical and non-medical students. In all, 14 students did not specify whether they were medical or non-medical students. Among medical students, 221 were studying in pre-clinical years (year 1 or 2) and 307 in clinical years (year 3, 4 or 5).

A great majority (97.7%) of the participants had lived in Hong Kong for $\geq$7 years. Approximately 75% of the participants had specified their ethnic origin. Among these, 97.6% were Chinese. Although 487 (63.6%) participants had no religious belief, 249 (32.5%) were Christians and a few were Buddhists.

Close relatives or friends of 194 participants had died in the past year, and the participants had visited them during their illness; however, 555 participants had no such experience. In addition, among the participants, only 429 (81.3%) medical students and 75 (33.6%) non-medical students had heard of DNR before participating in the study.

Tables 1 and 2, respectively show the comparison between the attitudes of medical and non-medical students, and of clinical and preclinical students to a DNR proposal. Table 3 lists the choices of medical students in various scenarios.

Clinical students had a lower tendency, compared with preclinical medical students, to perform CPR on an elderly man or a young patient with HIV with severe pneumonia and a poor chance of recovery, despite family wishes being otherwise, if the patient had expressed a wish to die ($p = 0.043$ and 0.028, respectively).

In all, 67% of our participants, regardless of background, disagreed that DNR should be proposed in a patient according to family wishes if the patient's wish was not known. However, more participants who had experienced close relatives or friends dying in the past year whom they had visited during their illness, compared with those who had not, agreed to this DNR proposal (mean score 3.03 and 2.82, respectively, $p = 0.038$).

While participants emphasised respect for the patient's wish, 68.4% disagreed that DNR should be proposed on a critically ill patient with a failed suicidal attempt. Nevertheless, more participants who had experienced close relatives or friends dying in the past year whom they had visited during their illness, compared with those who had not, agreed to this DNR proposal (mean score 3.09 and 2.82, respectively, $p = 0.014$).

Familiarity of DNR did influence some of the participants' decisions. More participants who had heard of DNR, compared with those who had not, agreed to a DNR proposal on a patient who had expressed a wish for no CPR (mean score 4.13 and 3.69, respectively, $p<0.001$); who was expected to live for no longer than 1 month before the present illness (mean score 3.33 and 3.08, $p = 0.013$); who was 100 years old and critically ill (mean score 3.50 and 3.28, $p = 0.031$); who had very advanced stage cancer with poor quality of life (mean score 3.78 and 3.23, $p<0.001$); and who was a 1-week-old baby with severe congenital abnormalities and with poor survival chances (mean score 3.71 and 3.38, $p = 0.001$). Participants with a prior knowledge of DNR had a lower tendency, compared with those who had not, to agree to CPR on an elderly man with severe pneumonia with a poor chance of recovery, despite family wishes being otherwise, if the patient had expressed a wish to die ($p = 0.004$).

The patient's age was also a factor to consider in DNR decisions. While approximately 50% of participants disagreed with a DNR proposal on a 100-year-old critically ill patient, 72.5% disagreed if the decision was made on a critically ill 25-year-old.

A majority of participants disagreed with consideration of the cost of treatment in the DNR decision, whether the cost was paid by the government or the patient (74.5% and 76.0%, respectively).

Most participants (72.9%) considered the patient's wish as the highest priority in DNR decisions, followed by the chance of recovery from CPR (23.3%), family wishes (1.7%), social well-being of the patient (1.5%) and cost to the government (0.6%). Few participants changed their priority after modification of the scenarios.

DISCUSSION

Our study showed that medical education and clinical exposure might have influenced the students' views on DNR decisions. Medical students, especially those with clinical exposure, tended to agree more to a DNR proposal on a patient who did not want CPR, and on those with a limited survival chance and a poor quality of life, compared with non-medical students.

Table 1 Attitudes of medical and non-medical students to a do-not-resuscitate proposal

Situation	Medical students' mean (SD) score	Non-medical students' mean (SD) score	p Value
A patient who was mentally competent and had expressed his or her wish for no CPR	4.08 (1.376)	3.76 (1.335)	0.005
A patient who was expected to live for no longer than 1 month	3.31 (1.294)	3.07 (1.242)	0.025
A patient who had very advanced stage cancer with poor quality of life	3.75 (1.301)	3.27 (1.288)	<0.001
A patient who was a 1-week-old baby with severe congenital abnormalities and poor survival chances	3.67 (1.302)	3.45 (1.329)	0.034
A patient who was critically ill from a failed suicide attempt	2.83 (1.319)	3.04 (1.351)	0.042
A patient who was 25 years old and was critically ill due to severe head injury in a car crash	2.75 (1.247)	3.10 (1.301)	0.001

CPR, cardiopulmonary resuscitation; 1, strongly disagree; 6, strongly agree.

Our study also showed that prior knowledge of DNR might influence one's choice on whether DNR should be carried out in a certain clinical situation. However, 66.4% of non-medical university students and 18.7% of medical students had never heard of DNR. We believe that the concept of DNR should be promoted among the general public to facilitate people in making more rational choices.

Unlike a typical Chinese community with a relatively collectivist culture, Hong Kong is a Chinese community with much Western influence, in particular the younger generation, who are more influenced by individualistic liberal values. Most of our participants would respect the patient's autonomy if the patient was mentally competent. Family wishes were considered less important. However, it would be premature to conclude that the young people in Hong Kong do not consider the views of the older generation, because respecting the wishes of older family members is regarded as a filial act in Chinese culture. In Hong Kong, doctors may make DNR decisions based on the views of family members, which may result in a delay in initiating discussion with the patient while he or she is still mentally competent. Our results have cast doubt on the usefulness of initiating a DNR discussion with the family members of patients, without patient participation. A majority of our participants disagreed to DNR if the patient's wish was unknown, even if family members refused CPR. A suicidal attempt might not imply a wish to withhold CPR. Although the patient's wish to withhold CPR is respected, participants tended to disagree on carrying out a DNR order in the case of a suicide attempt. By contrast, those who had had a dying friend or relative in the past year agreed more to a DNR proposal in these two conditions. They might have witnessed the suffering of loved ones.

According to our findings, the patient's own wish was probably a very important factor for people both with and without a medical background in choosing whether DNR should be applied or not. Yap *et al*[13] found that only 52% of doctors of intensive care units in Hong Kong would discuss DNR orders directly with the patient, but 89% would discuss the DNR order with the family. Studies in Britain and Japan showed that many doctors would write DNR orders even if the patient objected.[14–16] We think the practice of discussing DNR orders directly with the patient should be encouraged.

Furthermore, Hong Kong has not yet had specific legislation on an advance directive,[4] by which patients could express their own view on whether life-sustaining treatment should be carried out on them in the event of a future loss of decision-making capacity. Although we did not have much discussion on this topic in our study, we believe that the legislation on this issue would help the healthcare team and the patient's family in deciding on whether to order DNR or not.

In some past studies and consensus statements, it has been suggested that the patient's family has the moral authority to forego life-sustaining treatment for an incompetent patient who does not have an advance directive based on what they believe the patient would have wanted (that so-called substituted judgement standard).[2 17] However, our participants generally did not agree that DNR should be proposed because the family did not want CPR, with the patient's wish not known. Studies had also shown that family members might misinterpret the wishes of elderly relatives.[17–20] We tend to agree with the Hong Kong Hospital Authority guidelines, which state that ''Sometimes, the family may not agree to a life-sustaining treatment which is considered by the healthcare team to be essential and for the best interests of the patient. Legally, the care team can go on with such treatment. However, other than emergency situations, a consensus should be reached with the family if possible.''[4 11]

In our study, we have also found that clinical exposure and familiarity with the DNR order would affect the choice of carrying out DNR or not. As in our results, medical students, especially those studying in clinical years and those who have heard of DNR before participating in the study, would have a

Table 2 Attitudes of clinical and preclinical students to a DNR proposal

Situation	Clinical students' mean (SD) score	Preclinical students' mean (SD) score	p Value
A patient who was mentally competent and had expressed his or her wish for no CPR	4.19 (1.396)	3.94 (1.337)	0.036
A patient who had chronic severe brain damage and was incapable of taking care of himself or herself	3.58 (1.279)	3.21 (1.190)	0.001
A patient who was 100 years old and was critically ill due to severe head injury in a car crash	3.52 (1.350)	3.22 (1.221)	0.011
A patient who had very advanced stage cancer with poor quality of life	3.91 (1.318)	3.53 (1.243)	0.001
A patient who was a 1-week-old baby with severe congenital abnormalities and poor survival chances	3.86 (1.330)	3.43 (1.225)	<0.001

CPR, cardiopulmonary resuscitation; 1, strongly disagree; 6, strongly agree.

Table 3 Percentage of students who agreed that cardiopulmonary resuscitation should be performed in scenarios 1 and 2

		Experience of the death of a near relative or friend			Heard of DNR before questionnaire		
Scenario (n)	All	Yes	No	p Value (χ^2)	Yes	No	p Value (χ^2)
1 (663)	88.5	86.3	89.3	0.284	88.1	89.4	0.606
1a (708)	46.3	44.1	47.3	0.458	42.6	54.0	0.004
1b (699)	78.1	77.4	78.4	0.777	78.8	77.2	0.629
1c (696)	82.5	83.1	82.4	0.836	83.0	81.7	0.677
1d (698)	80.9	80.9	81.0	0.966	81.1	81.0	0.959
1e (696)	81.3	84.1	80.5	0.286	83.4	77.5	0.059
2 (583)	86.4	83.9	87.5	0.253	86.2	87.4	0.704
2a (696)	45.3	44.2	45.7	0.733	43.3	49.4	0.132
2b (698)	76.5	75.9	76.8	0.806	77.2	75.4	0.602
2c (694)	81.4	80.3	81.9	0.659	82.3	80.1	0.489
2d (697)	79.2	77.9	79.7	0.616	80.4	77.2	0.321
2e (695)	79.6	80.3	79.4	0.785	80.6	77.9	0.415

DNR, do-not-resuscitate.
1a and 2a, patient having expressed a wish to die.
1b and 2b, patient having poor pre-morbid status.
1c and 2c, patient being socially isolated.
1d and 2d, high cost of treatment.
1e and 2e, family insisting on DNR.

different response from non-medical university students and those who have not heard of DNR before participating in the study. Although Al-Mobeireek[9] did not find that physician's rank had any significant effect on the factors given by him when considering DNR, we think that this difference could be due to the difference in questionnaires used, target population and culture.

According to our findings, gender did not have much influence on the choice of DNR, but further studies are needed to confirm this. Concerning religious perspectives, our study did not find much difference between Christians and those without religious belief in DNR decisions. Few religions have specific declarations on the legitimacy of the DNR order, although most faith traditions have more general declarations on decisions about life-sustaining treatment.[2] Further studies could be carried out concerning this topic.

The limitations of our study include the following:

1. There are too few non-medical students in this study. The low response rate might have introduced bias.
2. Questionnaires were mainly distributed in the campus of the University of Hong Kong, and site selection might result in bias.
3. Medical students are future medical practitioners only. There may be a difference in attitude towards DNR between current medical practitioners and medical students.
4. Our study population mainly represents university students of ages ranging from 19 to 25 years. Their attitudes towards DNR might not be the same as the general public.
5. The DNR decisions that people make in real-life situations may be different from those on completing a questionnaire.

CONCLUSION

This study has shown that clinical exposure and familiarity with the DNR order might have a certain influence on deciding whether to order DNR for a patient. In addition, people from both the medical and non-medical fields would usually consider the patient's own wish as the most important factor when deciding whether CPR should be carried out.

This study also showed that family wishes was not a very important factor. Therefore, we think that if a patient has lost his or her ability to make a decision, the healthcare team should use their clinical judgement and other factors that they consider important when deciding whether CPR should be carried out, but not based solely on family wish. We believe that the healthcare team should try their best to reach a consensus with the family members.

We would also like to encourage doctors to discuss the DNR order directly with the patient unless the patient is totally non-communicable or has lost his or her decision-making ability. Moreover, we also think that training in communication and decision making about DNR orders in healthcare professionals, and public education on the concept of DNR in Hong Kong is probably not enough. We believe that these types of education would help in DNR decision making, and also improve the doctor–patient relationship.[2 12 13]

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